be materially reduced by early opening of the cerebral cavity," nor that "perhaps bilateral opening of the mastoids in typical cerebro-spinal meningitis will act as thoroughly as opening the abdominal cavity in tuberculosis." In our opinion this child recovered from cerebro-spinal meningitis in spite of the mastoid operations and not in consequence of them.

Cold in Acute Otitis and Mastoiditis.—J. O. TANSLEY (*Transactions of the American Otological Society*, July, 1899) is opposed to the use of cold in acute otitis media and in acute mastoiditis, as it may dull the pain too thoroughly and act as a mask of the true state of disease in these parts, thus leading to delay in performing needed operations.

Mastoid Operations.—A. LUCÆ (*Archiv. f. Ohrenh.*, November 20, 1899), while admitting that in many cases he has by the mastoid operation in its various forms cured chronic suppurations in which all other methods failed, also is assured that, after four years' experience in many thousands of cases, he has cured many cases of chronic suppuration of the ears with irrigation with formalin solution (1–1000) in warm water that otherwise would have required a mastoid operation. Furthermore, if a faithful trial of formalin fails to cure a chronic otorrhœa, Lucæ considers such a failure as an indication for a mastoid operation. He believes one should be prouder of saying, "I have cured so many cases of otorrhœa without operation," than of saying, "I have performed so many mastoid operations for the cure of purulent otitis media."

Excision of Ossicles.—GRUNERT and ZERONI (*Archiv f. Ohrenh.*, August 3, 1899) maintain, rightly, we think, that excision of the hammer and incus for the cure of chronic purulent otitis media has been unjustly superseded to a great degree by the so-called radical operation on the antrum and mastoid. Observation of a large number of patients has led them to conclude that excision of diseased ossicles will usually cure the chronic purulency and prevent mastoiditis and its sequelæ, and they have frequently been called upon to perform mastoid operations that would never have been needed if excision of the ossicles by way of the auditory canal had been performed in time.

PATHOLOGY AND BACTERIOLOGY.

UNDER THE CHARGE OF

F. B. MALLORY, M.D.,

ASSISTANT PROFESSOR OF PATHOLOGICAL ANATOMY, HARVARD UNIVERSITY.

On the Growth of Carcinomata of the Skin and Mucous Membranes.—LOHMER (*Ziegler's Beiträge*, 1900, xxviii., 372).

The theory that carcinomata arise by the epithelium growing down into the underlying tissues rests chiefly on the works of Thiersch and Waldeyer, and for many years this view has been generally accepted. Recently, however, the histogenesis of carcinoma has become the subject of much discussion, owing to a theory advanced by Ribbert that carcinoma does not owe its origin primarily to an increased proliferative energy of epithelial cells, which enables them to invade connective tissue, but to a separation of a group or mass of epithelial cells from their normal relations. This separation, according to him, is due chiefly to a growth of connective tissue which surrounds and cuts off some of the epithelial cells, which then, after their separation, acquire the proliferative power of carcinoma cells.

This theory of Ribbert's has met with a good deal of opposition, partly because it does not agree with the view held by most investigators that there occurs a primary morphological and biological change in the epithelial cells which renders them capable of malignant growth; partly because it is not in harmony with the interpretation heretofore put on a whole series of the most different histologic carcinoma—preparations which have been looked upon as typical pictures.

These pictures and the interpretation of them recur in nearly all of the publications directed against Ribbert's views. The most important of them are the so-called "transition pictures," namely, what is seen at the edge of young and old carcinomata, where the normal epithelium merges, without any distinct line of demarcation, into the fully developed carcinoma.

Ribbert defends his position by claiming that false conclusions have been drawn from these pictures. He interprets them otherwise: The carcinoma may have developed in the middle of a papillary tumor or of an adenomatous polyp—such a combination is not so very rare—or the pictures seen may be due to the growth of the connective tissue leading to papillary projections of the skin and to modifications of glands of mucous membrane; a third interpretation is that the tumor, which grows not only downward and laterally, may also grow upward and become joined to the epithelial covering; in such cases it would look as though the surface epithelium had grown downward. This latter point is unquestionably true, and is accepted by all writers.

Lohmer examined twenty-three carcinomata of the skin and a number from mucous membranes, many of them by means of serial sections. On the basis of his own work and that of others he strongly opposes Ribbert's theory. Eight carcinomata of the lip, for example, showed a marked downward growth of the epithelium, in most cases to the muscle layer. As a rule, it extended as broad, thick masses into the connective tissue. In seven of the cases there was a gradual merging of the normal epidermis into the tumor. In all of these cases a secondary junction of the normal downward projections of the epidermis with extensions of the tumor could be ruled out, as could also the assumption that the carcinoma developed in the middle of a papilloma or that the epithelial processes were stretched by a growth of connective tissue. The writer believes that the infiltration of the cutis with round cells is secondary, and follows the changes due to the epithelial invasion.

In carcinomata of the mucous membranes he found an upward growth of the tumor and union with the epithelium rather more frequent than in carcinoma of the skin.

The writer believes that Ribbert's theory does not fit all cases, because in the greater number of the carcinomata which he examined a direct growth of the tumor into the depths and a spread at the periphery could be demonstrated. Long, branching masses of epithelium could be followed without any break from the surface epithelium directly into the underlying connective tissue. At its periphery the tumor spreads by gradual involvement of the neighboring epithelium, which then grows directly downward into the underlying connective tissue. It is necessary to return, therefore, to the assumption that the starting-point of a carcinoma is to be found in a primary proliferative energy of epithelial cells. The cause of this proliferative energy is still unknown.

Gland-like Carcinoma of Epidermic Origin.—KROMPECHER (*Ziegler's Beiträge*, 1900, xxviii., 1).

Braun, in 1892, described certain tumors of the skin which differed clinically and histologically from the ordinary epidermoid carcinomata, and which, according to him, could not be derived from the glandular structures of the skin. He declared them to be endotheliomata.

According to Krompecher, the diagnosis of endothelioma can be made only when the origin of the tumor masses from the lymph endothelium of the larger lymph spaces can be directly followed or when a carcinoma-like tumor is found in places such as bone and lymph nodes, where epithelium is lacking and the structure of the suspicious tumor corresponds to that of tumors already firmly established as endotheliomata.

Braun was not able to demonstrate the origin of the tumors from endothelial cells, and the histological picture does not at all correspond to the picture of proved endotheliomata. He based his diagnosis on the difference of structure as compared with ordinary epidermoid carcinomata, on the absence of epithelial pearls, and especially on the lack of any connection between the tumor and the skin.

Krompecher believes that these tumors are not endotheliomata, but carcinomata. He bases his arguments and opinions on a study of thirty-three cases, of which twenty-one are described in detail. The tumors were derived from cheek, forehead, breast, eyelid, nose, back, tongue, cervix uteri, lumbar region, and ear.

In fourteen of the twenty-one cases he was able to demonstrate by means of serial sections the connection of the tumors with the surface epithelium and thereby prove their epithelial character.

The striking feature of these tumors is their microscopical structure. While the epidermoid carcinoma is composed of the cylindrical cells of the stratum Malpighii and of polygonal prickle cells, which by cornification give rise to the epithelial pearls, the group of tumors under consideration is distinguished by the fact that only the cylindrical layer of the stratum Malpighii grows; the epithelial cells constantly retain their embryonic character, and the nests of tumor cells consist simply of long, cylindrical cells, which stain intensely. Under a high power such a tumor often looks strikingly like a spindle-cell sarcoma. Inside of the cell nests no cornification or formation of epithelial pearls can be found.

The microscopical picture of these growths varies greatly according as the cells grow as solid masses, in narrow "meandering" ribbons, or lining canals and cysts. Combinations of these various forms occur with each other and also rarely with the ordinary form of epidermoid carcinoma. The writer recognizes six different types, but it is not necessary to consider them in detail here.

Secondary degeneration of the connective tissue stroma is frequent and quite characteristic. The degeneration may be hyaline or myxomatous.

Krompecher believes that the gross and microscopical appearances and clinical features of this class of tumors are sufficiently peculiar and characteristic to establish them as a separate group of carcinomata, to which he gives the name "carcinoma epitheliale adenoides."

Suppurative Myelitis in a Case of Bronchiectasis.—CHIARI (*Zeitschrift f. Heilkunde*, 1900, xxi., 351) sums up the brief literature of suppurative myelitis, and adds a case which came under his observation. But fourteen cases in all have been published: of these, three were traumatic in origin, and three were due to direct extension from lesions outside the cord. Of the remaining eight cases, three occurred as metastatic lesions in cases of bronchiectasis.

In the case reported by the writer, beside meningitis of the brain and cord, abscesses filled with thick yellowish-green pus were found in the cerebellum and in three different parts of the cord.

In the lower lobes of the lungs were numerous bronchiectatic cavities up to the size of hazel-nuts, and the bronchi showed numerous cylindrical dilatations.

Coverslip preparations from the pus in the abscesses and in bronchiectatic cavities showed the micrococcus lanceolatus, and the same micro-organism was obtained in cultures.

Sections through the wall of the abscesses in the cerebellum and in the cord showed, however, beside the micrococcus lanceolatus, numerous clumps of fine, branching threads which stained by Gram; they lay partly within bloodvessels, partly in the perivascular lymph spaces. The micro-organism was evidently a streptothrix and closely resembled the actinomyces. It was not obtained in the cultures. Evidently it had reached the nervous system metastatically from the bronchiectases through the circulation.

The case suggests, the writer thinks, that it would be well to examine the bacteria present in cases of bronchiectases; the actinomyces may be found because such a large proportion of the cases of myelitis are associated with bronchiectasis, and because the actinomyces is the micro-organism which seems most frequently to give rise to metastatic lesions in the central nervous system.

In favor of this view the writer mentions a second case of his in which there were both bronchiectasis and abscess of the brain with secondary suppurative meningitis. Both in the bronchiectatic cavities and in the abscess of the brain a streptothrix was found resembling in all respects the micro-organism of the case reported.

Internal Pachymeningitis.—MELNIKOW-RASWEDENKOW (*Ziegler's Beiträge*, 1900, xxviii., 217).

Jores and his students have claimed that idiopathic pachymeningitis is a pathological process which has its seat in the capillary layer, perhaps also in the bloodvessels generally, of the dura, and which gives rise to a new formation of capillaries and to constantly recurring hemorrhages.

As this is contrary to the generally accepted view, the writer reinvestigated the subject. He studied, first, the normal structure of the dura, using particularly Weigert's elastic tissue stain. In the inner of the two layers of the dura could be distinguished from within out: 1. A single layer of epithelium, which covers the inner surface. 2. A hyaloid, fenestrated, elastic membrane, which varies much with age and with the individual; it is absent at birth, is well marked in early adult life, and is thick in old age. 3. The inner capillary network. 4. A layer of connective tissue mixed with elastic fibres. According to the results of histological and embryological investigations, the dura mater is a peculiar formation and has nothing in common with the pleural and peritoneal serosæ.

The writer then studied twelve cases of pachymeningitis. Of these, three only showed proliferation of the epithelial cells on the inner surface of the dura, with some exudation of fibrin and leucocytes. The important point was that the process occurred on the surface of the internal elastic membrane. Later, organization of this exudation takes place; thin-walled capillaries grow out from the capillary layer through spaces in the internal elastic membrane.

It is characteristic of this process for hemorrhages to take place from these newly formed bloodvessels; they often burst, and then the blood pours out into the delicate, loose connective tissue. The exuded blood is rapidly absorbed, as is shown by the numerous pigment masses of various sizes. The pigment lies partly in cells, partly out of them, and is heaped up especially around the bloodvessels in the deeper layers close to the limiting elastic membrane.

There may be repeated hemorrhages; then there are several layers of connective tissue showing different stages of development; the oldest is next to the internal limiting membrane.

The general view that the pathological process is an inflammation, with hemorrhage following as a complication, is accepted by the writer. The less accepted view of a hemorrhage on the surface of the dura followed by inflammation may occasionally be true.

In the origin of pachymeningitis in man toxæmias play an important part. They produce the histological changes in the dura, in consequence of which the peculiar inflammatory process develops.

The Pigment in Brown Induration of the Lungs.—NEUMANN (*Virchow's Archiv*, 1900, vol. clxi., p. 422) has recently been investigating the question whether the well-known yellow to reddish-brown pigment which occurs in the lung in chronic passive congestion, and which gives the iron reaction, can lose this power to give the iron reaction and change to a melanotic pigment. The problem was taken up because the results obtained by various investigators of this subject do not agree.

In his investigations Neumann found along with carbon, which is never lacking, only one other pigment, and that differed in no way from the hemosiderin which arises in other parts of the body from extravasations. It has a more or less saturated yellow, yellowish-brown, or reddish-brown color, without any gray, blackish, or black tinge; often it appears colorless, or at least of an extremely pale yellow, and it always gives a strong iron reaction.

Examination of fresh tissues is advised; but tissues hardened in alcohol or in Müller's fluid give good results. Artificial stains are for the most part unnecessary and in part disadvantageous. It is best to compare parts of the lung which macroscopically show no carbon with other parts containing much of it. Where carbon is wanting the usual masses of hemosiderin are found, chiefly within the large " heart-failure cells " in the alveoli. Where much carbon is present the masses of pigment are darker in color, and lie mostly in the connective tissue stroma; the low power of the microscope shows all transitions from yellow hemosiderin to black carbon. High power shows that each dark pigment mass consists of a central black nucleus surrounded by a yellowish mantle of varying thickness. The unquestionable interpretation of these masses is that they are particles of carbon surrounded by hemosiderin. In this way arise the pigment granules first described by Virchow and later forgotten, namely, one-half or one-third black and the rest yellow or red.

Against the view that these central black bodies are due to a secondary melanotic change of the substance of the hemosiderin, he urges the facts that the dark nuclear formations are usually sharply limited at the periphery and show no zone of transition, and that several dark nuclei may lie within one pigment mass.

He believes that the retrograde changes in the pigment, instead of beginning in the middle of a mass and proceeding outward, begin at the periphery, and he regards the colorless border around the carbon particles as the last stage in the metamorphosis of the hemosiderin.

He believes, further, that the hemosiderin is deposited on the carbon from hæmoglobin in solution, and that red-blood globules cannot turn to yellow and brown granules without solution taking place.

The Histological Changes in Striated Muscle Adjoining Malignant Tumors.—Fujinami (*Virchow's Archiv*, 1900, clxi., 115) studied the effects produced on muscle-tissue by twenty sarcomata and seventeen carcinomata.

In general the two classes of tumors may be said to invade muscle-tissue in much the same way. They may infiltrate between the separate muscle-fibres, they may press against them as a mass, or they may be separated from the fibres by bands of connective tissue, thus affecting the muscle-fibres indirectly only.

The infiltration takes place not only through the tissue spaces and the lymph and bloodvessels, but also through the sarcolemma sacs. This invasion of the sarcolemma sac and extension through it is much more common with carcinoma than with sarcoma. It is especially marked where the infiltration of the muscle is parallel with the muscle-fibres. With the sarcomata it has been observed only in the round-cell variety. The invasion or non-invasion by the tumor-cells of the sarcolemma sac depends on the biological relation of the tumor-cells themselves, on the direction of their growth, and on the nature of the changes in the muscle-substance.

The changes which take place in the muscle-fibres as the result of the invasion of muscle tissue by the tumor are manifold. All the possible degenerative changes which occur in the various lesions of muscle may be present, and they may occur very irregularly in the individual fibres. The commonest form is simple atrophy, but the most interesting are (*a*) the multiplication of the nuclei, (*b*) the irregular or ampullar atrophy, and (*c*) the formation of giant-cells.

(*a*) Ordinarily the muscle nuclei disappear as the muscle-fibre atrophies. In other cases, however, they appear very active, increasing greatly in number (the writer counted 153 in one fibre), chiefly, perhaps exclusively, by direct division. They may form single or double rows, or (*c*) may collect in clumps which on cross section appear like giant cells.

(*b*) Sometimes the tumor cells press against the side of the muscle-fibres causing irregular atrophy which gives an ampullar or beaded appearance to the muscle-fibres.

One point to be insisted on is that all the changes which occur in regenerating muscle, and which are looked upon as regenerative in nature, occur practically in the same form at the periphery of a malignant growth where there can be no question of regeneration. Apparently the muscle-fibre can show at a certain stage of regressive change an appearance similar, or nearly similar, to that seen at the beginning of its development; it is necessary, therefore, to guard against judging from microscopical examination only whether regeneration or degeneration is present.

In many cases there occurs at the edge of the tumor, as the result of reaction on the part of the tissues, a change in the interstitial tissue of the muscle due to round-cell infiltration, growth of the connective tissue, and growth of the intima of the vessels. These all exert an effect on the muscle-fibres. A round-cell infiltration of the perimysium at the edge of the tumor is, as a rule, more frequent and more marked with carcinoma than with sarcoma.

Two conclusions drawn by the writer cannot be accepted without further proof, namely, that cell formations may arise from altered muscle-fibres and take part in the formation of tumor-cells, and that the muscle-fibres may be converted into connective tissue.

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All communications should be addressed to

DR. FRANCIS R. PACKARD, 1831 Chestnut Street, Philadelphia, U. S. A.
Or
DR. HECTOR MACKENZIE, 34 Upper Brook Street, Grosvenor Square, London, W., England.